# Conceptual Model Development and Reactive Transport Modeling for the 300 Area Uranium Plume in 300-FF-5

***May 10-11, 2004***
***EMSL Building/Room 1077***

**FINAL AGENDA**

## Monday, May 10

8:00 am Registration – EMSL Lobby

### *Motivation and Objectives*

8:30 - 8:45 Introduction and meeting objectives (John Zachara, PNNL)

8:45 - 9:00 Motivation and goal in light of RIFS schedule (Mike Thompson, DOE)

9:00 - 9:20 Regulatory comments (Mike Goldstein, EPA; Dib Goswami, WA-DOE)

9:20 - 10:15 Reactive Transport Modeling of U(VI) Migration at the Naturita Site (Gary Curtis, U.S.G.S.)

10:15 - 10:30 *BREAK*

### *Plume Characteristics and Current Status*

10:30 – 10:45 Waste disposal history of the 300 Area process ponds (John Zachara, PNNL)

10:45 - 11:30 Hydrology and current status of the 300 Area U plume (Robert Peterson, PNNL)

11:30 - 12:00 Recent sampling and characterization of 300 A U plume sediments and groundwaters (Steve Smith and John Zachara, PNNL)

12:00 - 1:00 *LUNCH*

### *Conceptual Model Development*

*Chemical and mineralogic nature of sorbed U*

1:00 - 1:20 Electron and X-ray microscopy of process pond and vadose zone sediments (James McKinley, PNNL)

1:20 - 1:40 Synchrotron X-ray measurements of U valence and speciation (Jeff Catalano, Stanford Univ.)

1:40 - 2:00 Laser induced fluorescence spectroscopic studies of sorbed U(VI) speciation (Zheming Wang, PNNL)

*Release rates and desorption/adsorption behavior*

2:00 - 2:20 Dissolution from near surface sediments (Odeta Qafoku, PNNL)

2:20 - 2:40 Batch measurements of desorption/adsorption from vadose zone and aquifer sediments (John Zachara and Steve Smith, PNNL)

2:40 - 3:00 Advective studies of desorption/adsorption on vadose zone sediments (Nik Qafoku and Chongxuan Liu, PNNL)

3:00 - 3:15 *BREAK*

*Adsorption model development*

3:15 - 4:00 Labile U(VI) and progress toward a generalized surface complexation model (Jim Davis and Deb Bond, U. S. G. S.)

### *300 Area Plume Reactive Transport Modeling (RTM)*

4:00 - 4:30 Preliminary modeling of the 300 Area U(VI) plume: Three-dimensional modeling of variably saturated flow and uranium transport in the 300 Area (Mark Rockhold, PNNL)

4:30 - 5:00 Objectives and tentative scientific approach for additional reactive transport modeling of the 300 Area plume (Steve Yabusaki, PNNL)

5:00 *Adjourn for the day*

## Tuesday, May 11

Discussion of reactive transport modeling for the 300 Area plume leading to a modeling plan and preliminary roadmap of needed data development and modeling activities. (John Zachara and Steve Yabusaki to moderate)

8:00 - 8:45 Modeling objectives and strategy revisited

- ❖ Calculation scale, focus, and duration
- ❖ Desired contribution to decision-making
- ❖ Candidate codes

8:45 - 9:30 Geochemical reaction network and parameters

- ❖ Functional form of reaction parameters
- ❖ Equilibrium versus kinetic formulations
- ❖ Type and nature of process-level models (adsorption/desorption; precipitation/dissolution)

9:30 - 10:15 Sediment geohydrophysical "model" and transport processes including advection and diffusion and their descriptive parameters

- ❖ Vadose zone and aquifer hydrologic properties
- ❖ Vadose zone recharge flux
- ❖ Mass transport limitations of reactive species
- ❖ Materials heterogeneity and the distribution of fines and other reactive phases

10:15 - 10:30 *BREAK*

10:30 - 11:15 Scale-up of reaction parameters from lab to field [Lab materials are < 2 mm in size; field materials are considerably more coarse]

- ❖ Equilibrium and kinetic geochemical parameters
- ❖ Mass transport parameters

11:15 - 12:00 Develop preliminary, "consensus" modeling plan and schedule of needed inputs, developments, and modeling activities

12:00 - 12:30 Closing remarks (Mike Thompson, DOE; Mark Freshley and John Zachara, PNNL)

12:30 pm *Adjourn*